

1 This listing of claims will replace all prior versions, and listings, of claims  
2 in the application.

3  
4 **Listing of Claims:**

5  
6 Claim 1 (Original): A processor-readable medium comprising processor-  
7 executable instructions for focusing optics, the processor-executable instructions  
8 comprising instructions for:

9 generating a data profile, wherein the data profile is configured to provide  
10 signals for operation of an actuator, wherein the signals result in focus of the  
11 optics on a label region of an optical disc; and

12 printing an image on the label region of the optical disc while focusing the  
13 optics by applying signals to the actuator according to the data profile.  
14

15 Claim 2 (Original): A processor-readable medium as recited in claim 1,  
16 wherein generating the data profile comprises further instructions for:

17 configuring a look-up table with signal data, wherein the signal data are  
18 associated with focusing on locations within the label region.  
19

20 Claim 3 (Original): A processor-readable medium as recited in claim 1,  
21 wherein generating the data profile comprises further instructions for:

22 configuring a function to generate signal data, wherein the function  
23 associates locations within the label region with appropriate signals.  
24  
25

1           Claim 4 (Original): A processor-readable medium as recited in claim 3,  
2 wherein configuring a function comprises further instructions for:  
3           generating coefficient data for a Fourier series.  
4

5           Claim 5 (Original): A processor-readable medium as recited in claim 3,  
6 wherein configuring a function comprises further instructions for:  
7           generating coefficient data for a polynomial series.  
8

9           Claim 6 (Original): A processor-readable medium as recited in claim 1,  
10 wherein the generating comprises further instructions for:  
11           applying an AC component of a signal to the actuator as the optical disc  
12 turns, wherein the AC component causes the optics to pass through a focal point in  
13 both directions on each cycle of the AC component; and  
14           recording a voltage into a voltage data look-up table which was applied to  
15 the actuator and which was associated with a SUM signal peak which resulted  
16 from the passage of the optics through the focal point.  
17

18           Claim 7 (Original): A processor-readable medium as recited in claim 6  
19 wherein the sum signal peak is determined by measuring sides of the sum signal  
20 peak and averaged.  
21

22           Claim 8 (Original): A processor-readable medium as recited in claim 6,  
23 comprising additional instructions for adjusting the recorded voltage by a phase  
24 shift corresponding to a lag time associated with the operation of the actuator.  
25

1 Claim 9 (Original): A processor-readable medium as recited in claim 6,  
2 comprising further instructions for:

3 calibrating the actuator to determine an angle by which the actuator lags an  
4 input signal for at least one frequency; and

5 adjusting the recorded voltage by the angle.

6  
7 Claim 10 (Original): A processor-readable medium as recited in claim 6,  
8 wherein applying the AC component of the signal comprises instructions to repeat  
9 the AC signal at a frequency which results in at least eight SUM signal peaks per  
10 revolution of the optical disc.

11  
12 Claim 11 (Currently amended): A processor-readable medium  
13 comprising processor-executable instructions for focusing optics, the processor-  
14 executable instructions comprising instructions for:

15 generating a data profile, wherein the data profile is configured to provide  
16 signals for operation of an actuator, wherein the signals result in focus of the  
17 optics on a label region of an optical disc;

18 printing an image on the label region of the optical disc while focusing the  
19 optics by applying signals to the actuator according to the data profile;

20 ~~A processor-readable medium as recited in claim 1, comprising further~~  
21 ~~instructions for:~~

22 calibrating the actuator to determine an angle by which the actuator lags an  
23 input signal for frequencies associated with printing the image at least two radial  
24 distances from a hub of the optical disc; and

1 organizing the data profile according to the at least two radial distances and  
2 according to signals resulting in focus in a plurality of sectors of the optical disc.

3  
4 Claim 12 (Original): A processor-readable medium as recited in claim 11,  
5 wherein calibrating the actuator comprises further instructions for:

6 applying an AC signal to the actuator, wherein the AC signal results in the  
7 actuator moving the optics back and forth through a focal point causing a plurality  
8 of SUM signal peaks;

9 adjusting a DC offset to the signal until the plurality of SUM signal peaks  
10 are evenly space; and

11 measuring an angle between a SUM signal peak and an associated mid-  
12 point of the AC signal.

13  
14 Claim 13 (Original): A processor-readable medium as recited in claim 12,  
15 wherein applying the AC component of the signal comprises instructions for  
16 applying a triangle wave to the actuator.

17  
18 Claim 14 (Original): A processor-readable medium as recited in claim 11,  
19 comprising further instructions for:

20 moving the optics toward a hub location of the optical disc; and

21 maintaining the optical disc in a stationary condition during the calibrating.

22  
23 Claim 15 (Currently amended): A processor-readable medium  
24 comprising processor-executable instructions for focusing optics, the processor-  
25 executable instructions comprising instructions for:

1 generating a data profile, wherein the data profile is configured to provide  
2 signals for operation of an actuator, wherein the signals result in focus of the  
3 optics on a label region of an optical disc; and

4 printing an image on the label region of the optical disc while focusing the  
5 optics by applying signals to the actuator according to the data profile;

6 ~~A processor-readable medium as recited in claim 1,~~ wherein generating the  
7 data profile comprises instructions for including data within the data profile  
8 associated with at least two radial distances from a center of the optical disc,  
9 wherein the data associated with each radial distance is phase-shifted according to  
10 a lag-time of the actuator at a frequency associated with printing a portion of the  
11 image on the label region of the optical disc located approximately at the radial  
12 distance.

13  
14 Claim 16 (Original): A processor-readable medium as recited in claim 1,  
15 comprising further instructions for:

16 indexing the data profile according to an angular orientation of the optical  
17 disc; and

18 fetching data from the data profile according to the angular orientation of  
19 the optical disc during the printing of the image on the label region.

20  
21 Claim 17 (Original): A processor-readable medium as recited in claim 1,  
22 wherein printing the image comprises further instructions for:

23 interpolating between data in the data profile; and

24 applying the interpolated values to the actuator wherein a specific data for  
25 the actuator is not prescribed by the data profile.

1  
2 Claim 18 (Original): A processor-readable medium as recited in claim 1,  
3 wherein printing the image comprises further instructions for:

4 interpolating between measured signals within the data profile using an at  
5 least first-order equation; and

6 wherein the interpolating is a function of an angular orientation of the  
7 optical disc.

8  
9 Claim 19 (Original): A processor-readable medium as recited in claim 1,  
10 wherein printing the image comprises further instructions for:

11 interpolating between measured signals within the data profile using an at  
12 least first-order equation; and

13 wherein the interpolating is a function of a radial distance by which a focal  
14 point is from a center of the optical disc.

15  
16 Claim 20 (Original): A processor-readable medium as recited in claim 1,  
17 wherein printing the image comprises further instructions for:

18 interpolating voltage data between known levels within a voltage data look-  
19 up table using a second-order equation; and

20 using the interpolated voltage data to control operation of the actuator  
21 wherein a specific voltage level for the actuator is not prescribed by the voltage  
22 look-up table.

1 Claim 21 (Original): A processor-readable medium as recited in claim 1,  
2 comprising instructions which configure the data profile as a piece-wise  
3 continuous function.  
4

5 Claim 22 (Currently amended): A processor-readable medium comprising  
6 processor-executable instructions for focusing optics, the processor-executable  
7 instructions comprising instructions for:

8 generating a data profile, wherein the data profile is configured to provide  
9 signals for operation of an actuator, wherein the signals result in focus of the  
10 optics on a label region of an optical disc;

11 printing an image on the label region of the optical disc while focusing the  
12 optics by applying signals to the actuator according to the data profile; and

13 configuring the data profile as a piece-wise continuous function.~~A~~  
14 ~~processor-readable medium as recited in claim 21,~~ wherein the instructions which  
15 configure the piece-wise continuous function phase-shift the piece-wise  
16 continuous function by an angle associated with a lag time associated with the  
17 operation of the actuator.  
18

19 Claim 23 (Original): A method for focusing optics, comprising:

20 generating a data look-up table, wherein the data look-up table provides  
21 signal levels for operation of an actuator which result in focus of the optics on a  
22 plurality of locations within a label region of an optical disc; and

23 printing an image on the label region of the optical disc while focusing the  
24 optics by applying signals to the actuator according to the data look-up table.  
25

1 Claim 24 (Original): A method as recited in claim 23, wherein the  
2 generating comprises:

3 applying an AC component of a signal to the actuator as the optical disc  
4 turns, wherein the AC component causes the optics to pass through a focal point in  
5 both directions on each cycle of the AC component; and

6 recording a signal into the data look-up table which was applied to the  
7 actuator and which was associated with a SUM signal peak which resulted from  
8 the passage of the optics through the focal point.

9  
10 Claim 25 (Original): A method as recited in claim 24, wherein the sum  
11 signal peak is determined by measuring sides of the sum signal peak and averaged.

12  
13 Claim 26 (Currently amended): A method as recited in claim 2[[3]]4,  
14 additionally comprising adjusting the recorded signal by a phase shift  
15 corresponding to a lag time associated with the operation of the actuator.

16  
17 Claim 27 (Currently amended): A method for focusing optics,  
18 comprising:

19 generating a data look-up table, wherein the data look-up table provides  
20 signal levels for operation of an actuator which result in focus of the optics on a  
21 plurality of locations within a label region of an optical disc;

22 printing an image on the label region of the optical disc while focusing the  
23 optics by applying signals to the actuator according to the data look-up table;

24 ~~A method as recited in claim 23, additionally comprising for:~~  
25



1 calibrating the actuator to determine an angle by which the actuator lags an  
2 input signal for at least one frequency; and  
3 adjusting the recorded signal by the angle.  
4

5 Claim 28 (Original): A method as recited in claim 23, wherein the  
6 generating a data look up table comprises:

7 applying an AC component of a signal to the actuator as the optical disc  
8 turns, wherein the AC component causes the optics to pass through a focal point in  
9 both directions on each cycle of the AC component; and

10 recording a signal into the data look-up table which was applied to the  
11 actuator and which was associated with recognizing a pattern on the optical disc  
12 which resulted from the passage of the optics through the focal point.  
13

14 Claim 29 (Currently amended): A method for focusing optics,  
15 comprising:

16 generating a data look-up table, wherein the data look-up table provides  
17 signal levels for operation of an actuator which result in focus of the optics on a  
18 plurality of locations within a label region of an optical disc;

19 printing an image on the label region of the optical disc while focusing the  
20 optics by applying signals to the actuator according to the data look-up table; and

21 ~~A method as recited in claim 23, additionally comprising:~~

22 calibrating the actuator to determine an angle by which the actuator lags an  
23 input signal for frequencies associated with printing the image at least two radial  
24 distances from a hub of the optical disc; and  
25

1 organizing the look-up table according to the at least two radial distances  
2 and according to signals resulting in focus in a plurality of sectors of the optical  
3 disc.

4  
5 Claim 30 (Original): A method as recited in claim 29, wherein calibrating  
6 the actuator comprises:

7 applying an AC signal to the actuator, wherein the AC signal results in the  
8 actuator moving the optics back and forth through a focal point causing a plurality  
9 of SUM signal peaks;

10 adjusting a DC offset to the signal until the plurality of SUM signal peaks  
11 are evenly space; and

12 measuring an angle between a SUM signal peak and an associated mid-  
13 point of the AC signal.

14  
15 Claim 31 (Original): A method as recited in claim 29, wherein calibrating  
16 the actuator comprises:

17 applying an AC signal to the actuator, wherein the AC signal results in the  
18 actuator moving the optics back and forth through a focal point causing a multiple  
19 recognitions of a pattern marked on the optical disc;

20 adjusting a DC offset to the signal until the multiple recognitions are evenly  
21 space; and

22 measuring an angle between a time of a recognition and an associated mid-  
23 point of the AC signal.

1 Claim 32 (Currently amended): A method for focusing optics,  
2 comprising:

3 generating a data look-up table, wherein the data look-up table provides  
4 signal levels for operation of an actuator which result in focus of the optics on a  
5 plurality of locations within a label region of an optical disc; and

6 printing an image on the label region of the optical disc while focusing the  
7 optics by applying signals to the actuator according to the data look-up table;

8 ~~A method as recited in claim 23,~~ wherein generating the data look-up table  
9 comprises including data within the look-up table associated with at least two  
10 radial distances from a center of the optical disc, wherein the data associated with  
11 each radial distance is phase-shifted according to a lag-time of the actuator at a  
12 frequency associated with printing a portion of the image on the label region of the  
13 optical disc located approximately at the radial distance.

14  
15 Claim 33 (Original): A method as recited in claim 23, further comprising:  
16 indexing the data look-up table according to angular orientation of the  
17 optical disc; and

18 fetching data from the look-up table according to the angular orientation of  
19 the optical disc during the printing of the image on the label region.

20  
21 Claim 34 (Original): A method as recited in claim 23, wherein the data  
22 look-up table is configured as a piece-wise continuous function.

1       Claim 35 (Original): A system for focusing optics, comprising:  
2       logic configured for generating a data profile, wherein the profile is  
3       configured to provide signals for operation of an actuator, wherein the signals  
4       result in focus of the optics on a label region of an optical disc; and  
5       logic configured for printing an image on the label region of the optical disc  
6       while focusing the optics by applying signals to the actuator according to the data  
7       profile.

8  
9       Claim 36 (Original): A system as recited in claim 35, wherein generating  
10      the data profile comprises:

11      logic configured for forming a look-up table with signal data, wherein the  
12      signal data are associated with focusing on a plurality of locations within the label  
13      region.

14  
15      Claim 37 (Original): A system as recited in claim 35, wherein generating  
16      the data profile comprises:

17      logic for configuring generation of a function to produce signals, wherein  
18      the function associates locations within the label region with appropriate signals to  
19      result in focus on the locations.

20  
21      Claim 38 (Original): A system as recited in claim 37, wherein the logic for  
22      configuring generation of the function comprises:

23      logic configured for generating coefficients for a Fourier series.  
24  
25

1 Claim 39 (Original): A system as recited in claim 37, wherein the logic for  
2 configuring generation of the function comprises:

3 logic configured for generating coefficients for a polynomial series.  
4

5 Claim 40 (Original): A system as recited in claim 35, wherein the logic  
6 configured for generating a data profile comprises:

7 logic configured for applying an AC component of a signal to the actuator  
8 as the optical disc turns, wherein the AC component causes the optics to pass  
9 through a focal point in both directions on each cycle of the AC component; and

10 logic configured for recording a voltage into a voltage data look-up table  
11 which was applied to the actuator and which was associated with a SUM signal  
12 peak which resulted from the passage of the optics through the focal point.  
13

14 Claim 41 (Original): A system as recited in claim 40, additionally  
15 comprising logic configured for adjusting the recorded voltage by a phase shift  
16 corresponding to a lag time associated with the operation of the actuator.  
17

18 Claim 42 (Original): A system as recited in claim 40, wherein the logic  
19 configured for applying the AC component of the signal comprises logic  
20 configured for repeating the AC signal at a frequency which results in at least  
21 eight SUM signal peaks per revolution of the optical disc.  
22  
23  
24  
25

1 Claim 43 (Original): A system as recited in claim 35, wherein the logic  
2 configured for generating comprises:

3 logic configured for applying an AC component of a signal to the actuator  
4 as the optical disc turns, wherein the AC component causes the optics to pass  
5 through a focal point in both directions on each cycle of the AC component; and

6 logic configured for recording a voltage into a voltage data look-up table  
7 within the data profile, wherein the voltage was applied to the actuator and was  
8 associated with a recognition of a pattern on the optical disc which resulted from  
9 the passage of the optics through the focal point.

10  
11 Claim 44 (Currently amended): A system for focusing optics,  
12 comprising:

13 logic configured for generating a data profile, wherein the profile is  
14 configured to provide signals for operation of an actuator, wherein the signals  
15 result in focus of the optics on a label region of an optical disc;

16 logic configured for printing an image on the label region of the optical disc  
17 while focusing the optics by applying signals to the actuator according to the data  
18 profile; and

19 ~~A system as recited in claim 35, further comprising:~~

20 logic configured for calibrating the actuator to determine an angle by which  
21 the actuator lags an input signal for frequencies associated with printing the image  
22 at least two radial distances from a hub of the optical disc; and

23 logic configured for organizing a look-up table within the data profile  
24 according to the at least two radial distances and according to voltages resulting in  
25 focus in a plurality of sectors of the optical disc.

1  
2 Claim 45 (Original): A system as recited in claim 44, wherein logic  
3 configured for calibrating the actuator comprises:

4 logic configured for applying an AC signal to the actuator, wherein the AC  
5 signal results in the actuator moving the optics back and forth through a focal  
6 point causing a plurality of SUM signal peaks;

7 logic configured for adjusting a DC offset to the signal until the plurality of  
8 SUM signal peaks are evenly space; and

9 logic configured for measuring an angle between a SUM signal peak and an  
10 associated mid-point of the AC signal.  
11

12 Claim 46 (Original): A system as recited in claim 44, wherein logic  
13 configured for calibrating the actuator comprises:

14 logic configured for applying an AC signal to the actuator, wherein the AC  
15 signal results in the actuator moving the optics back and forth through a focal  
16 point causing multiple recognitions of a pattern on the optical disc;

17 logic configured for adjusting a DC offset to the signal until the  
18 recognitions are evenly space; and

19 logic configured for measuring an angle between a recognition and an  
20 associated mid-point of the AC signal.  
21

22 Claim 47 (Original): A system as recited in claim 44, further comprising:

23 logic configured for moving the optics toward a hub location of the optical  
24 disc; and  
25

1 logic configured for maintaining the optical disc in a stationary condition  
2 during the calibrating.

3  
4 Claim 48 (Currently amended): A system for focusing optics,  
5 comprising:

6 logic configured for generating a data profile, wherein the profile is  
7 configured to provide signals for operation of an actuator, wherein the signals  
8 result in focus of the optics on a label region of an optical disc;

9 logic configured for printing an image on the label region of the optical disc  
10 while focusing the optics by applying signals to the actuator according to the data  
11 profile;

12 ~~A system as recited in claim 35,~~ wherein the logic configured for  
13 generating the data profile comprises logic configured for including data within a  
14 look-up table within the data profile, wherein the data is associated with at least  
15 two radial distances from a center of the optical disc, and wherein the data  
16 associated with each radial distance is phase-shifted according to a lag-time of the  
17 actuator at a frequency associated with printing a portion of the image on the label  
18 region of the optical disc located approximately at one of the at least two radial  
19 distances.

20  
21 Claim 49 (Original): A system as recited in claim 35, further comprising:  
22 logic configured for indexing a voltage data look-up table within the data  
23 profile according to angular orientation of the optical disc; and  
24  
25



1 logic configured for fetching voltage data from the look-up table according  
2 to the angular orientation of the optical disc during the printing of the image on the  
3 label region.

4  
5 Claim 50 (Original): A system as recited in claim 35, wherein the logic  
6 configured for printing the image comprises:

7 logic configured for interpolating between voltage levels obtained from a  
8 voltage look-up table within the data profile; and

9 logic configured for applying the interpolated values to the actuator  
10 wherein a specific voltage level for the actuator is not prescribed by the voltage  
11 look-up table.

12  
13 Claim 51 (Original): A system as recited in claim 35, wherein the logic  
14 configured for printing the image further comprises:

15 logic configured for interpolating between voltage levels in a voltage look-  
16 up table within the data profile using a first-order equation; and

17 wherein the logic configured for the interpolating is a function of an  
18 angular orientation of the optical disc.

19  
20 Claim 52 (Original): A system as recited in claim 35, wherein the logic  
21 configured for printing the image comprises:

22 logic configured for interpolating signal data between known signals  
23 obtained from the data profile; and

24 logic configured for using the interpolated signals to control operation of  
25 the actuator.

1  
2 Claim 53 (Original): A system as recited in claim 35, additionally  
3 comprising logic configured for configuring the data profile as a piece-wise  
4 continuous function.

5  
6 Claim 54 (Currently amended): A system for focusing optics,  
7 comprising:

8 logic configured for generating a data profile, wherein the profile is  
9 configured to provide signals for operation of an actuator, wherein the signals  
10 result in focus of the optics on a label region of an optical disc;

11 logic configured for printing an image on the label region of the optical disc  
12 while focusing the optics by applying signals to the actuator according to the data  
13 profile; and

14 logic configured for configuring the data profile as a piece-wise continuous  
15 function ~~A system as recited in claim 53,~~ wherein the logic configured for  
16 configuring the piece-wise continuous function phase-shifts the piece-wise  
17 continuous function by an angle associated with a lag time associated with the  
18 operation of the actuator.

19  
20 Claim 55 (Original): An optical disc drive comprising:  
21 means for generating a data profile, wherein the data profile is configured  
22 to provide signals for operation of an actuator, wherein the signals result in focus  
23 of the optics on a label region of an optical disc; and  
24  
25

1 means for printing an image on the label region of the optical disc while  
2 focusing the optics by applying signals to the actuator according to the data  
3 profile.

4  
5 Claim 56 (Original): An optical disc drive as recited in claim 55, wherein  
6 the means for generating the data profile further comprises:

7 means for configuring a look-up table with signal data, wherein the signal  
8 data are associated with focusing on locations within the label region.

9  
10 Claim 57 (Original): An optical disc drive as recited in claim 55 wherein  
11 the means for generating the data profile further comprises:

12 means for configuring a function to generate signal data, wherein the  
13 function associates locations within the label region with appropriate signals.

14  
15 Claim 58 (Original): An optical disc drive as recited in claim 55 wherein  
16 the means for generating the data profile further comprises:

17 means for applying an AC component of a signal to the actuator as the  
18 optical disc turns, wherein the AC component causes the optics to pass through a  
19 focal point in both directions on each cycle of the AC component; and

20 means for recording a voltage into a voltage data look-up table which was  
21 applied to the actuator and which was associated with a SUM signal peak which  
22 resulted from the passage of the optics through the focal point.

1 Claim 59 (Currently amended): An optical disc drive comprising:  
2 means for generating a data profile, wherein the data profile is configured  
3 to provide signals for operation of an actuator, wherein the signals result in focus  
4 of the optics on a label region of an optical disc;

5 means for printing an image on the label region of the optical disc while  
6 focusing the optics by applying signals to the actuator according to the data  
7 profile; and

8 ~~An optical disc drive as recited in claim 55 further comprising:~~

9 means for calibrating the actuator to determine an angle by which the  
10 actuator lags an input signal for frequencies associated with printing the image at  
11 least two radial distances from a hub of the optical disc; and

12 means for organizing the data profile according to the at least two radial  
13 distances and according to signals resulting in focus in a plurality of sectors of the  
14 optical disc.

15  
16 Claim 60 (Currently amended): An optical disc drive comprising:  
17 means for generating a data profile, wherein the data profile is configured  
18 to provide signals for operation of an actuator, wherein the signals result in focus  
19 of the optics on a label region of an optical disc;

20 means for printing an image on the label region of the optical disc while  
21 focusing the optics by applying signals to the actuator according to the data  
22 profile; and

23 ~~An optical disc drive as recited in claim 55 wherein the means for~~  
24 ~~generating the data profile further comprises:~~  
25

1 means for including data within the data profile associated with at least two  
2 radial distances from a center of the optical disc, wherein the data associated with  
3 each radial distance is phase-shifted according to a lag-time of the actuator at a  
4 frequency associated with printing a portion of the image on the label region of the  
5 optical disc located approximately at the radial distance.

6  
7 Claim 61 (Original): An optical disc drive as recited in claim 55 further  
8 comprising:

9 means for indexing the data profile according to an angular orientation of  
10 the optical disc; and

11 means for fetching data from the data profile according to the angular  
12 orientation of the optical disc during the printing of the image on the label region.

13  
14 Claim 62 (Original): An optical disc drive as recited in claim 55 wherein  
15 the means for printing further comprises:

16 means for interpolating between data in the data profile; and

17 means for applying the interpolated values to the actuator wherein a  
18 specific data for the actuator is not prescribed by the data profile.

19  
20 Claim 63 (Original): An optical disc drive as recited in claim 55 wherein  
21 the means for printing further comprises:

22 means for interpolating between measured signals within the data profile  
23 using an at least first-order equation; and wherein the means for interpolating is a  
24 function of an angular orientation of the optical disc.